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DEGREE DAY ESTIMATION USING THOM'S METHOD - A FLOW DIAGRAM FOR A PROGRAMMABLE CALCULATOR

L D J HARVEY

For the monthly estimation of degree days, above or below any base, Thom's method (Thom, 1966) is extremely useful.

In Agricultural Memorandum No 527 (Harvey 1973) a method was described in which Thom's method was presented in a graphical form, thus eliminating the need for calculation. For a 28, 30 and 31 day month a family of curves was produced from which one could read off directly the estimated degree days for the month above (or below) a given base. For this two parameters were required.

i. the difference between the monthly mean temperature and the given base.

ii. the standard deviation of the monthly mean temperature (extracted from Meteorological Office Professional Notes No 125).

With the advent of an advanced programmable calculator a programme for estimating degree days by Thom's method was found to be even more convenient and time saving. This programme has been communicated privately to other interested parties who have requested that it be published.

Thom devised a formula relating degree days above (or below) any given base to a parameter l, determined from a table of values of h, where h is a function of the standard deviation of the monthly mean temperature. Using a standard non-linear regression programme of the Wang calculator, the expression $l = .195 - .5h + .322h^2$ for values of h between -.7 and .77 was obtained. For values of $h < -.7$, $l = -h$ and for values of $h > .77$, $l = 0$. This was then incorporated in a programme for the desk top calculator.

The flexibility and sophistication of a programme is of course, dependant on the capability of the machine for which it is intended. Therefore the appended flow diagram is in its most simple form.

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Cambridge

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REFERENCES

Harvey, L D J (1973) — Simple computation of degree days above or below any base. Agricultural Memorandum No 527

Shellard, H C — Averages of Accumulated temperature and standard Deviation of Monthly Mean Temperature over Britain, 1921-50. Meteorological Office, Professional Notes No 125.

Thom, H C S (1966) — Normal Degree Days above any base by the Universal Truncation Coefficient. US Weather Bureau, Monthly Weather Review, July 1966

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A FLOW DIAGRAM FOR THE CALCULATION OF "DAYS ABOVE OR BELOW* ANY BASE USING THOM'S METHOD.

*for "days below any base this becomes $(T_b - \bar{T}_m)$.